

## CLAIMS

1. A video processing apparatus for specifying frames to be start frames of a plurality of viewing segments when segmenting a content, comprising:

a specifying information memory storing pieces of specifying information each showing a feature of frames to be specified as start frames and each corresponding to a different type of content;

a content obtaining unit operable to obtain a content; an information obtaining unit operable to obtain type information showing the type of the obtained content;

an extracting unit operable to extract from the specifying information memory a piece of specifying information corresponding to the type shown by the obtained type information; and

a specifying unit operable to specify start frames present in the content, in accordance with the extracted piece of specifying information.

2. The video processing apparatus of Claim 1, wherein each piece of specifying information further shows a feature of frames to be specified as presentation frames, each of which is to be displayed as a representative still image of a respective viewing segment, and

the specifying unit further specifies presentation frames present in the content, in accordance with the extracted piece of specifying information.

3. The video processing apparatus of Claim 2, further

comprising:

an index storage unit operable to store, in correspondence with the content, display times of each start frame and presentation frame specified by the specifying unit.

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4. The video processing apparatus of Claim 2, wherein the features shown by the specifying information are detectable through at least one of video analysis, still image analysis, and audio analysis, and

10 the specifying unit specifies the start frames and presentation frames through at least one of video analysis, still image analysis, and audio analysis.

5. The video processing apparatus of Claim 4, wherein

15 the specifying information includes:

a first condition showing a feature of frames to be detected as candidates for presentation frames;

an exclusion condition showing a feature of frames to be excluded from candidates for presentation frames;

20 a second condition showing a feature of frames to be detected as candidates for start frames; and

a selection condition showing a relation between a presentation frame and a frame that is to be selected as a start frame, and

25 the specifying unit specifies the presentation frames by detecting frames satisfying the first condition from all frames present in the content and subsequently excluding frames satisfying the exclusion condition from the detected frames, and specifies the start frames by detecting frames  
30 satisfying the second condition from all the frames present

in the content and subsequently selecting, from the detected frames, frames satisfying the relation shown by the selection condition with respect to the specified presentation frames.

- 5 6. The video processing apparatus of Claim 5, wherein the specifying unit includes:

a plurality of detecting subunits each operable to detect frames having a different feature;

10 an excluding subunit operable to exclude frames satisfying the exclusion condition from frames satisfying the first condition; and

a selecting subunit operable to select frames satisfying the relation shown by the selection condition from frames satisfying the second condition, and

15 the first condition, the exclusion condition, and the second condition each are an identifier of one of the detecting subunits to be used.

7. The video processing apparatus of Claim 4, wherein

20 when operating in accordance with a piece of specifying information corresponding to a predetermined type of content, the specifying unit (i) detects from all the frames present in the content, large-caption start frames each of which is a first frame of a series of frames during which a caption  
25 of a size larger than a threshold continuously appears in a predetermined region, small caption frames in each of which a caption of a size smaller than a threshold appears in a region other than the predetermined region, CM frames which constitute a commercial message, and transition frames each  
30 of which is a first frame of a series of frames of similar

images, (ii) specifies as a presentation frame each frame remaining after removing the small-caption frames and the CM frames from the large-caption start frames, and (iii) specifies as a start frame, for each presentation frame, a  
5 closest preceding transition frame to the presentation frame.

8. The video processing apparatus of Claim 4, wherein

when operating in accordance with a piece of specifying information corresponding to a predetermined type of content,  
10 the specifying unit (i) excludes frames which constitute a commercial message from all the frames present in the content, (ii) detects from the remaining frames, large-caption start frames each of which is a first frame of a series of frames during which a caption of a size larger than a threshold  
15 continuously appears in a predetermined region, small caption frames in each of which a caption of a size smaller than a threshold appears in a region other than the predetermined region, and transition frames each of which is a first frame of a series of frames of similar images, (iii) specifies as  
20 a presentation frame each frame remaining after removing the small-caption frames from the large-caption start frames, and (iv) specifies as a start frame, for each presentation frame, a closest preceding transition frame to the presentation frame.

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9. The video processing apparatus of Claim 4, wherein

when operating in accordance with a piece of specifying information corresponding to a predetermined type of content, the specifying unit (i) detects from all the frames present  
30 in the content, large-caption start frames each which is a

first frame of a series of frames during which a caption of a size larger than a threshold continuously appears in a predetermined region, small caption frames in each of which a caption of a size smaller than a threshold appears in a region other than the predetermined region, CM frames which constitute a commercial message, and silent frames of which audio data is below a predetermined volume level, (ii) specifies as a presentation frame each frame remaining after removing the small-caption frames and the CM frames from the large-caption start frames, and (iii) specifies as a start frame, for each presentation frame, a closest silent frame to the presentation frame.

10. The video processing apparatus of Claim 4, wherein when operating in accordance with a piece of specifying information corresponding to a predetermined type of content, the specifying unit (i) excludes frames which constitute a commercial message from all the frames present in the content, (ii) detects from the remaining frames, large-caption start frames each of which is a first frame of a series of frames during which a caption of a size larger than a threshold continuously appears in a predetermined region, small caption frames in each of which a caption of a size smaller than a threshold appears in a region other than the predetermined region, and silent frames of which audio data is below a predetermined volume level, (iii) specifies as a presentation frame each frame remaining after removing the small-caption frames from the large-caption start frames, and (iv) specifies as a start frame, for each presentation frame, a closest preceding silent frame to the presentation frame.

11. The video processing apparatus of Claim 4, wherein  
when operating in accordance with a piece of specifying  
information corresponding to a predetermined type of music  
5 program, the specifying unit (i) detects from all the frames  
present in the content, large-caption start frames each of  
which is a first frame of a series of frames during which  
a caption of a size larger than a threshold continuously appears  
in a predetermined region, small caption frames in each of  
10 which a caption of a size smaller than a threshold appears  
in a region other than the predetermined region, CM frames  
which constitute a commercial message, and music-start frames  
each of which is a first frame of a series of frames of which  
audio data represents a piece of music data, (ii) specifies  
15 as a presentation frame each frame remaining after removing  
the small-caption frames and CM frames from the large-caption  
start frames, and (iii) specifies as a start frame, for each  
presentation frame, a closest preceding music-start frame  
to the presentation frame.

20 12. The video processing apparatus of Claim 4, wherein  
when operating in accordance with a piece of specifying  
information corresponding to a predetermined type of music  
program, the specifying unit (i) excludes frames which  
25 constitute a commercial message from all the frames present  
in the content, (ii) detects from the remaining frames,  
large-caption start frames each of which is a first frame  
of a series of frames during which a caption of a size larger  
than a threshold continuously appears in a predetermined  
30 region, small caption frames in each of which a caption of

a size smaller than a threshold appears in a region other than the predetermined region, and music-start frames each of which is a first frame of a series of frames of which audio data represents a piece of music data, (iii) specifies as  
5 a presentation frame each frame remaining after removing the small-caption frames from the large-caption start frames, and (iv) specifies as a start frame, for each presentation frame, a closest preceding music-start frame to the presentation frame.

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13. The video processing apparatus of Claim 4, wherein  
when operating in accordance with a piece of specifying information corresponding to a predetermined type of content, the specifying unit (i) detects from all the frames present  
15 in the content, large-caption start frames each of which is a first frame of a series of frames during which a caption of a size larger than a threshold continuously appears in a predetermined region, small caption frames in each of which a caption of a size smaller than a threshold appears in a  
20 region other than the predetermined region, CM frames which constitutes a commercial message, and speech-start frames each of which is a first frame of a series of frames of which audio data represents a speech of a specific speaker, (ii) specifies as a presentation frame each frame remaining after  
25 removing the small-caption frames and the CM frames from the large-caption start frames, and (iii) specifies as a start frame, for each presentation frame, a closest preceding speech-start frame to the presentation frame.

30 14. The video processing apparatus of Claim 4, wherein

when operating in accordance with a piece of specifying information corresponding to a predetermined type of content, the specifying unit (i) excludes frames which constitute a commercial message from all the frames present in the content, (ii) detects from the remaining frames, large-caption start frames each of which is a first frame of a series of frames during which a caption of a size larger than a threshold continuously appears in a predetermined region, small caption frames in each of which a caption of a size smaller than a threshold appears in a region other than the predetermined region, and speech-start frames each of which is a first frame of a series of frames of which audio data represents a speech of a specific speaker, (iii) specifies as a presentation frame each frame remaining after removing the small-caption frames from the large-caption start frames, and (iv) specifies as a start frame, for each presentation frame, a closest preceding speech-start frame to the presentation frame.

15. The video processing apparatus of Claim 4, wherein

when operating in accordance with a piece of specifying information corresponding to a predetermined type of content, the specifying unit (i) detects from all the frames present in the content, CM-start frames each of which is a first frame of a series of frames which constitute a commercial message, and transition frames each of which is a first frame of a series of frames of similar images, (ii) specifies each CM-start frame as a start frame, and (iii) specifies as a presentation frame, for each start frame, a closest subsequent transition frame to the start frame.



16. The video processing apparatus of Claim 2, further comprising:

a playback unit operable to playback the content starting from a start frame specified by the specifying unit.

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17. The video processing apparatus of Claim 16, further comprising:

an index storing unit operable to store pairs display times of each start frame and presentation frame specified for a respective viewing segment by the specifying unit;

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a display unit operable to display a presentation frame specified for each viewing segment by the specifying unit; and

a user-selection unit operable to select at least one of the presentation frames displayed, in accordance with a user selection, wherein

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the playback unit plays back the content starting from a start frame of a viewing segment to which the user-selected presentation frame belongs.

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18. The video processing apparatus of Claim 17, wherein

the display unit displays the presentation frames by generating a thumbnail image of each presentation frame and displaying the thumbnail images in list form.

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19. The video processing apparatus of Claim 17, wherein

the user-selection unit stores the selected presentation frame as a reference image into the specifying information memory, and

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the specifying unit specifies the presentation frames

by detecting frames which are similar to the reference image with respect to a location of a region in which a caption appears.

5 20. The video processing apparatus of Claim 1, further comprising:

a recording unit operable to obtain a content and type information of the content, and to record the content to a recording medium in correspondence with the type information,  
10 wherein

after the recording unit records the type information and at least part of the content, the content obtaining unit sequentially obtains the part of the content from the recording medium, and

15 the specifying unit sequentially specifies start frame present in the part of the content obtained by the content obtaining unit.

21. The video processing apparatus of Claim 1, further  
20 comprising:

a recording unit operable to obtain a content and type information of the content, encode the content, and record the encoded content in correspondence with the type information, wherein

25 after the recording unit records the type information and encodes at least part of the content, the content obtaining unit sequentially obtains the encoded part of the content, and

the specifying unit obtains analyses of the encoded part  
30 conducted by the recording unit for the encoding, and

sequentially specifies start frame present in the encoded part using the analyses.

22. The video processing apparatus of Claim 1, further  
5 comprising:

an updating unit operable to obtain a new version of specifying information corresponding to a specific type of content, and record the new version of specifying information to the specifying information memory.

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23. The video processing apparatus of Claim 22, wherein  
the updating unit obtains the new version of specifying information when connected via a communication network to a provider apparatus for providing specifying information,  
15 and judging that the new version of specifying information is available, and

the new version of specifying information is recorded to the specifying information memory by updating a piece of specifying information stored therein corresponding to the  
20 specific type to the new version.

24. The video processing apparatus of Claim 23, wherein  
the judgment as to whether the new version of specifying information is available is made each time the specifying  
25 unit processes the specific type of content.

25. An integrated circuit for use in a video processing apparatus that specifies frames to be start frames of a plurality of viewing segments when segmenting a content, the  
30 video processing apparatus having a specifying information

memory storing pieces of specifying information each showing a feature of frames to be specified as start frames and each corresponding to a different type of content, the integrated circuit comprising:

- 5           a content obtaining module operable to obtain a content;  
          an information obtaining module operable to obtain type information showing the type of the obtained content;  
          an extracting module operable to extract from the specifying information memory a piece of specifying  
10       information corresponding to the type shown by the obtained type information; and  
          a specifying module operable to specify start frames present in the content, in accordance with the extracted piece of specifying information.

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- 26. A video processing method for use by a video processing apparatus that specifies frames to be start frames of a plurality of viewing segments when segmenting a content, the video processing apparatus having a specifying information  
20       memory storing pieces of specifying information each showing a feature of frames to be specified as start frames and each corresponding to a different type of content, the video processing method comprising the steps of:

- obtaining a content;
- 25       obtaining a type information showing a type of the obtained content;  
          extracting from the specifying information memory a piece of specifying information corresponding to the type shown by the obtained type information; and  
30       specifying start frames present in the content, in

accordance with the extracted piece of specifying information.

27. A video processing program for causing a device to specify  
5 frames to be start frames of a plurality of viewing segments  
when segmenting a content, the device having a specifying  
information memory storing pieces of specifying information  
each showing a feature of frames to be specified as start  
frames and each corresponding to a different type of content,  
10 the video processing program comprising the steps of:  
    obtaining a content;  
    obtaining a type information showing a type of the  
    obtained content;  
    extracting from the specifying information memory a piece  
15 of specifying information corresponding to the type shown  
by the obtained type information; and  
    specifying start frames present in the content, in  
accordance with the extracted piece of specifying  
information.

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